

WE CLAIM:

1. An image and audio signal degradation simulator comprising:

a digital signal processor comprising an input, a central processing unit, and an output, said signal processor operative to receive at said input a digital signal, said digital signal representing at least one of an image and audio;

a memory coupled to said signal processor; at least one algorithm stored in said memory,

10 said algorithm performing a predetermined signal degradation on said received digital signal; and

a display coupled to said signal processor and operative to display at least one of an image and audio represented by said digital signal degraded in accordance 15 with said algorithm and received from said signal processor.

2. The simulator of claim 1 wherein said memory comprises random access memory.

3. The simulator of claim 1 wherein said signal processor degrades said digital signal in accordance with said algorithm and said display displays said degraded signal received from said signal processor in real time upon 5 said signal processor's receipt of said digital signal.

4. The simulator of claim 1 wherein said signal processor degrades said digital signal in accordance with said algorithm and said display displays said degraded signal received from said signal processor substantially 5 immediately upon said signal processor's receipt of said digital signal.

5. The simulator of claim 1 further comprising a second processor coupled to said signal processor, said second processor operative to perform quantitative analysis

and provide degradation measurements of a degraded digital
5 signal received from said signal processor.

6. The simulator of claim 5 wherein said second
processor comprises a picture quality analyzer.

7. The simulator of claim 5 wherein said second
processor comprises an audio quality analyzer.

8. The simulator of claim 5 wherein said display
displays degradation measurements received from said second
processor.

9. The simulator of claim 5 wherein said
degradation measurements include a signal-to-noise ratio.

10. The simulator of claim 5 wherein said
degradation measurements include a frequency response.

11. The simulator of claim 1 further comprising
an analog-to-digital converter coupled to said input of said
signal processor.

12. The simulator of claim 1 further comprising a
digital-to-analog converter coupled to said output of said
signal processor.

13. The simulator of claim 1 further comprising
software that causes said display to display highlighting
over displayed portions of said degraded signal where signal
degradation exceeds a predefined threshold.

14. The simulator of claim 13 wherein said
highlighting comprises crosshatching.

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15. The simulator of claim 5 further comprising software that uses said degradation measurements to highlight portions of said displayed degraded signal where signal degradation exceeds a predefined threshold.

16. The simulator of claim 1 wherein said algorithm degrades said digital signal in accordance with MPEG video compression effects.

17. The simulator of claim 1 wherein said algorithm degrades said digital signal in accordance with cable transmission effects.

18. The simulator of claim 1 wherein said algorithm degrades said digital signal in accordance with a level of audio speaker distortion.

19. The simulator of claim 1 wherein said algorithm comprises a plurality of algorithms, each said algorithm performing a different predetermined signal degradation.

20. The simulator of claim 1 further comprising a graphical user interface to facilitate selection of said algorithm.

21. The simulator of claim 1 further comprising a lookup table to facilitate loading of said algorithm.

22. The simulator of claim 1 wherein said digital signal conforms to a Serial Data Interconnect standard.

23. An image and audio signal degradation simulator comprising:

a digital signal processor comprising an input, a central processing unit, and an output, said signal

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- 5 processor operative to receive at said input a digital signal, said digital signal representing at least one of an image and audio;
- a memory coupled to said signal processor;
at least one algorithm stored in said memory,
- 10 said algorithm performing a predetermined signal degradation on said received digital signal; and
- a display coupled to said signal processor and operative to display at least one of an image and audio represented by said digital signal degraded in accordance
- 15 with said algorithm and received from said signal processor; wherein:
- said signal processor degrades said digital signal in accordance with said algorithm and said display displays said degraded signal received from said signal
- 20 processor in real time upon said signal processor's receipt of said digital signal.

24. An image and audio signal degradation simulator comprising:

- a digital signal processor comprising an input, a central processing unit, and an output, said signal
- 5 processor operative to receive at said input a digital signal, said digital signal representing at least one of an image and audio;
- a memory coupled to said signal processor;
at least one algorithm stored in said memory,
- 10 said algorithm performing a predetermined signal degradation on said received digital signal;
- a display coupled to said signal processor and operative to display at least one of an image and audio represented by said digital signal degraded in accordance
- 15 with said algorithm and received from said signal processor; and
- a second processor coupled to said signal processor, said second processor operative to perform

quantitative analysis and provide degradation measurements
20 of a degraded digital signal received from said signal
processor; wherein:

said signal processor degrades said digital
signal in accordance with said algorithm and said display
displays said degraded signal received from said signal
25 processor in real time upon said signal processor's receipt
of said digital signal.

25. An image and audio signal degradation
simulator comprising:

a digital signal processor comprising an
input, a central processing unit, and an output, said signal
5 processor operative to receive at said input a digital
signal, said digital signal representing at least one of an
image and audio;

a memory coupled to said signal processor;
at least one algorithm stored in said memory,
10 said algorithm performing a predetermined signal degradation
on said received digital signal;

a display coupled to said signal processor
and operative to display at least one of an image and audio
represented by said digital signal degraded in accordance
15 with said algorithm and received from said signal processor;
and

a second processor coupled to said signal
processor, said second processor operative to perform
quantitative analysis and provide degradation measurements
20 of a degraded signal received from said signal processor;
wherein:

said display displays highlighting
superimposed over a displayed portion of said degraded
signal that exceeds a predefined threshold.

26. A method of simulating degraded image and
audio signals, said method comprising:

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receiving a signal representing at least one of an image and audio;

5 receiving a selection of at least one
algorithm, said algorithm performing a predetermined
degradation on said received signal;

processing said received signal in accordance with said algorithm to produce a degraded signal; and

10 displaying on a display at least one of an image and audio represented by said degraded signal.

27. The method of claim 26 further comprising:
receiving an analog signal;
converting said analog signal to said digital
signal.

28. The method of claim 26 further comprising:
outputting said degraded signal;
converting said outputted degraded signal to
an analog signal.

29. The method of claim 26 further comprising:
analyzing degradations of said degraded
signal;

providing degradation measurements of said
5 degraded signal in accordance with said analyzing.

30. The method of claim 29 wherein said analyzing comprises analyzing visual quality of an image represented by said degraded signal.

31. The method of claim 29 wherein said analyzing comprises analyzing audio quality of a sound represented by said degraded signal.

32. The method of claim 29 wherein said providing comprises displaying said degradation measurements on a display.

33. The method of claim 29 wherein said degradation measurements include a signal-to-noise ratio.

34. The method of claim 29 wherein said degradation measurements include a frequency response.

35. The method of claim 29 wherein said degradation measurements include a color quality measurement of an image represented by said degraded signal.

36. The method of claim 26 wherein said displaying comprises:

displaying on a display an image represented by said degraded signal;

5 highlighting portions of said displayed image where said degraded signal exceeds a preset degradation threshold.

37. The method of claim 26 wherein said received signal conforms to a Serial Data Interconnect standard.

38. The method of claim 26 wherein said algorithm performs signal degradation in accordance with MPEG video compression effects.

39. The method of claim 26 wherein said algorithm performs signal degradation in accordance with MPEG layer 3 audio compression effects.

40. The method of claim 26 wherein said algorithm performs signal degradation in accordance with cable transmission effects.

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41. The method of claim 26 wherein said algorithm performs signal degradation in accordance with a level of audio speaker distortion.

42. The method of claim 26 wherein said algorithm includes a discrete cosine transform.

43. The method of claim 26 wherein said processing and said displaying occur substantially simultaneously upon said receiving a signal.

44. The method of claim 26 wherein said processing and said displaying occur substantially simultaneously upon said receiving a selection.

45. The method of claim 26 wherein said processing and said displaying occur in real time upon said receiving a selection.

46. The method of claim 26 wherein said processing and said displaying occur in real time upon said receiving a signal.

47. The method of claim 26 wherein said receiving a selection comprises receiving a selection of a plurality of algorithms, each said algorithm performing a different predetermined signal degradation.

48. A method of simulating degraded image and audio signals, said method comprising:

receiving a signal representing at least one of an image and audio;

5 receiving a selection of at least one algorithm, said algorithm performing a predetermined degradation of said received signal;

processing said received signal in accordance
with said algorithm to produce a degraded signal;

10 analyzing degradations of said degraded
signal;

 providing degradation measurements of said
degraded signal in accordance with said analyzing; and

15 displaying on a display at least one of an
image and audio represented by said degraded signal.

49. A method of simulating degraded image and
audio signals, said method comprising:

 receiving a signal representing at least one
of an image and audio;

5 receiving a selection of at least one
algorithm, said algorithm performing a predetermined
degradation on said received signal;

 processing said received signal in accordance
with said algorithm to produce a degraded signal;

10 displaying on a display at least one of an
image and audio represented by said degraded signal; and

 highlighting on said display a portion of
said displayed degraded signal that exceeds a preset
degradation threshold.

50. An image and audio signal degradation
simulator comprising:

 memory means for storing a received digital
signal, said digital signal representing at least one of an
5 image and audio;

 degradation means for performing a
predetermined signal degradation on said received digital
signal; and

10 display means for displaying at least one of
an image and audio represented by said digital signal
degraded in accordance with said degradation means.

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51. An image and audio signal degradation simulator comprising:

means for receiving a signal representing at least one of an image and audio;

5 means for receiving a selection of at least one algorithm, said algorithm performing a predetermined degradation on said received signal;

means for processing said received signal in accordance with said algorithm to produce a degraded signal;

10 and

means for displaying on a display at least one of an image and audio represented by said degraded signal.

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